

IN THE CLAIMS:

The following amendment requests and discussions are provided for your information and consideration.

Claims 1 – 8 are cancelled.

Claim 9 is amended to read as follows:

9. A dual optical system, comprising:

a first optical subsystem, comprising a first plurality of lenses, wherein, a portion of the first plurality of lenses comprise cut-out sub-apertures and remaining apertures; and

a second optical subsystem, comprising a second plurality of lenses; wherein, a portion of the second plurality of lenses are positioned within a portion of the cut-out sub-apertures of the first set of lenses,

wherein, the first optical subsystem transmits a first band of optical wavelengths through the remaining apertures, and the second optical subsystem transmits a second band of optical wavelengths not transmitted by the first optical subsystem.

This amendment inserts no new matter, as Figures 3 – 6 show that the lens subsystems are pluralities of lenses, and that the first optical wavelength of light is transmitted through the remaining (not cut-out) portion of the first optical subsystems. In compliance with sec 1.121, a marked up version of Claim 9 is included in the listing of Claims.

Claim 10 is amended to read as follows:

10. The dual optical system of Claim 9, wherein the first optical subsystem and the second optical subsystem are refractive.

This amendment inserts no new matter as embodiments disclose wholly refractive optics. In compliance with sec 1.121, a marked up version of Claim 10 is included in the Claim Listing.

Claim 24 is amended to read as follows:

24. The dual optical system of Claim 23, wherein the first band of optical wavelengths is an infrared band, and the second band of optical wavelengths is a visible band.

Claim 24 is amended to correct a typographical error. In compliance with sec 1.121, a marked up version of Claim 24 is included in the CLAIMS LISTING.

Claim 25 is amended to read as follows:

25. A dual optical system, comprising:

- a first optical subsystem, comprising a first set of lenses, wherein, a portion of the first set of lenses comprise cut-out sub-apertures; and

- a second optical subsystem, comprising a second set of lenses; wherein, a portion of the second set of lenses are positioned within the sub-apertures of the first set of lenses, wherein

- the first optical subsystem further comprises a first variator group and a first compensator group, and

- wherein, the second optical subsystem further comprises a second variator group in contact with the first variator group and a second compensator group in contact with the first compensator group, and

- wherein, the dual optical system further comprises a zoom mechanism, capable of moving the first and second variator groups and the first and second compensator groups.

Claim 25 is amended to include the preceding claims and contains no new matter. In compliance with sec 1.121, a marked up version of Claim 25 is included in the CLAIMS LISTING. A fee transmittal was included with the original Office Action Response to add three additional independent claims.

Claims 26 and 27 are cancelled.

Claim 31 is amended to read as follows:

31. A dual band lens, having a visible optical path and an infrared optical path, comprising:

- a dual-band focus group, comprising

- an annular first infrared lens element having an inner radius, and

- a circular first visible lens element, located within the inner radius of the annular infrared lens element;

- a fixed infrared imaging group, comprising a plurality of fixed infrared lens elements; and

- a fixed visible imaging group, comprising a plurality of fixed visible lens elements;

- wherein, the dual band focus group and the fixed infrared imaging group are placed along the infrared optical path, and wherein the dual and focus group and the fixed visible imaging group are placed along the visible optical path,

- wherein a portion of the plurality of fixed infrared lens elements comprise cut-out sub-apertures, and wherein a portion of the visible optical path passes through the cut out sub-apertures,

- further comprising:

a dual-band variator group, comprising an infrared variator element positioned along the infrared optical path and a visible variator element positioned along the visible optical path, in contact with the infrared variator element;

a dual-band compensator group, comprising an infrared compensator element positioned along the infrared optical path and a visible compensator element positioned along the visible optical path, in contact with the infrared compensator element; and

a zoom mechanism, in contact with the dual band variator group and the dual band compensator group, capable of zooming the dual band lens.

Claim 31 is amended to include the preceding claims and contains no new matter. In compliance with sec 1.121, a marked up version of Claim 31 is included in the CLAIMS LISTING. A fee transmittal was included with the original Office Action Response to add additional independent claims.

Please add the following dependent claims:

32. The dual lens of Claim 31, wherein,

the dual-band focus group first infrared lens element has a first radius of curvature of approximately 73 mm, a second radius of curvature of approximately 2847 mm, a thickness of approximately 6 mm, a diameter of approximately 52 mm, and is formed of AMTIR4;

the dual-band focus group first visible lens element is a cemented doublet, having a first radius of curvature of approximately 0.95 inches, a second radius of approximately .49 inches a first thickness of approximately 10.04 inches of F2, a second thickness of approximately 0.2 inches of BK7, and a diameter of approximately 0.63 inches;

the infrared variator element has a first radius of curvature of approximately -46 mm, a second radius of approximately 53 mm, a

thickness of approximately 2.4 mm, a diameter of approximately 30 mm and is formed of AMTIR4;

the visible variator element is a cemented doublet, having a first radius of curvature of approximately -0.73 inches, a second radius of approximately 0.04 inches a first thickness of approximately 0.06 inches of SF6, a second thickness of approximately 0.04 inches of LAKN12, and a diameter of approximately 0.47 inches;

the infrared compensator element has a first radius of curvature of approximately 46 mm, a second radius of approximately 214 mm, a thickness of approximately 4 mm, a diameter of approximately 42 mm, and is formed of AMTIR4;

the visible compensator element is a cemented doublet, having a first radius of curvature of approximately 0.98 inches, a second radius of approximately 0.34 inches a first thickness of approximately 0.04 inches of LAF2, a second thickness of approximately 0.16 inches of SK4, and a diameter of approximately 0.39 inches;

the plurality of fixed infrared lens elements comprises:

a first lens, having a first radius of curvature of approximately 51 mm, a second radius of approximately 669 mm, a thickness of approximately 4 mm, a diameter of approximately 37 mm, formed of AMTIR4; and

a second lens, having a first radius of curvature of approximately infinity, a second radius of approximately infinity, a thickness of approximately 1 mm, a diameter of approximately 12 mm, formed of GE_LONG; and,

the plurality of fixed visible lens elements comprises:

a first lens, having a first radius of curvature of approximately 1.68 inches, a second radius of approximately 0.59 inches, a

thickness of approximately .08 inches, a diameter of approximately 0.47 inches, formed of SF57; and

a second lens, having a first radius of curvature of approximately 0.72 inches, a second radius of approximately -0.7 inches, a thickness of approximately 0.16 inches, a diameter of approximately 0.47 inches, formed of LAKN12.

33. The dual lens of Claim 25, wherein,

the dual-band focus group first infrared lens element has a first radius of curvature of approximately 73 mm, a second radius of curvature of approximately 2847 mm, a thickness of approximately 6 mm, a diameter of approximately 52 mm, and is formed of AMTIR4;

the dual-band focus group first visible lens element is a cemented doublet, having a first radius of curvature of approximately 0.95 inches, a second radius of approximately .49 inches a first thickness of approximately 10.04 inches of F2, a second thickness of approximately 0.2 inches of BK7, and a diameter of approximately 0.63 inches;

the infrared variator element has a first radius of curvature of approximately -46 mm, a second radius of approximately 53 mm, a thickness of approximately 2.4 mm, a diameter of approximately 30 mm and is formed of AMTIR4;

the visible variator element is a cemented doublet, having a first radius of curvature of approximately -0.73 inches, a second radius of approximately 0.04 inches a first thickness of approximately 0.06 inches of SF6, a second thickness of approximately 0.04 inches of LAKN12, and a diameter of approximately 0.47 inches;

the infrared compensator element has a first radius of curvature of approximately 46 mm, a second radius of approximately 214 mm, a

thickness of approximately 4 mm, a diameter of approximately 42 mm, and is formed of AMTIR4;

the visible compensator element is a cemented doublet, having a first radius of curvature of approximately 0.98 inches, a second radius of approximately 0.34 inches a first thickness of approximately 0.04 inches of LAF2, a second thickness of approximately 0.16 inches of SK4, and a diameter of approximately 0.39 inches;

the plurality of fixed infrared lens elements comprises:

a first lens, having a first radius of curvature of approximately 51 mm, a second radius of approximately 669 mm, a thickness of approximately 4 mm, a diameter of approximately 37 mm, formed of AMTIR4; and

a second lens, having a first radius of curvature of approximately infinity, a second radius of approximately infinity, a thickness of approximately 1 mm, a diameter of approximately 12 mm, formed of GE_LONG;

the plurality of fixed visible lens elements comprises:

a first lens, having a first radius of curvature of approximately 1.68 inches, a second radius of approximately 0.59 inches, a thickness of approximately .08 inches, a diameter of approximately 0.47 inches, formed of SF57; and

a second lens, having a first radius of curvature of approximately 0.72 inches, a second radius of approximately -0.7 inches, a thickness of approximately 0.16 inches, a diameter of approximately 0.47 inches, formed of LAKN12.

34. The dual optical system of Claim 21, wherein,

the first lens of the focus element has a first radius of curvature of approximately 63 mm, a second radius of curvature of approximately 750

mm, a thickness of approximately 6 mm, a diameter of approximately 51 mm, and is formed of AMTIR4;

the second lens of the focus group, has a first radius of curvature of approximately 37 mm, a second radius of approximately 389 mm a thickness of approximately 1.4, a diameter of approximately 12 mm, and is formed of F2;

the first set of lenses comprises:

a first infrared imaging lens, having a first radius of curvature of approximately -49 mm, a second radius of approximately -86 mm, a thickness of approximately 4.5 mm, a diameter of approximately 42 mm, formed of AMTIR4; and

a second infrared imaging lens, having a first radius of curvature of approximately 22 mm, a second radius of approximately 23 mm, a thickness of approximately 5 mm, a diameter of approximately 22 mm, formed of AMTIR4; and,

a third infrared imaging lens, having a first radius of curvature of approximately infinity, a second radius of approximately infinity, a thickness of approximately 1 mm, a diameter of approximately 12 mm, formed of GE_LONG;

the second set of lenses comprises:

a first visible imaging lens, having a first radius of curvature of approximately 37 mm, a second radius of approximately 389 mm inches, a thickness of approximately 0.7 mm, a diameter of approximately 9 mm, formed of FK5;

a second visible imaging lens, having a first radius of curvature of approximately 0.72 inches, a second radius of approximately -0.7 inches, a thickness of approximately 0.16 inches, a diameter of approximately 0.47 inches, formed of LAKN12;

a third visible imaging lens, being a cemented doublet, having a first radius of curvature of approximately -933 mm, a second radius of approximately -8.6 mm, a first thickness of approximately 3.4 mm of SK5, a second thickness of approximately 3.4 mm of SF11, and a diameter of approximately 12 mm; and,

a fourth visible imaging lens, having a first radius of curvature of approximately 47 mm, a second radius of approximately -22 mm, a thickness of approximately 3 mm, a diameter of approximately 12 mm, formed of BK7.

Claims 32 and 33 do not add new matter, as they describe the lens proportions disclosed in Tables 2A and 2B. Claim 34 does not introduce new matter; it uses the dimensions given in Table 2A and 2C. A fee transmittal was included with the original Office Action Response to add new dependent claims.